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(54) **Position indicating apparatus**

(57) A position indicating instrument comprising elongate primary (P) and secondary (S) mutual inductance coils in which the inductance of the secondary varies linearly over its length, and a metabolic member F, associated with the position to be indicated, displaceable along the secondary coil to cause a local perturbation in the magnetic field. The coils may be helical and with the number of turns per unit length varying along the length of the secondary, which is a pair of coils in opposite sense connected differentially. The coils may be of planar form, the primary being rectangular and the secondary triangular or the secondary may have a pair of opposed triangular coils.

Fig.1.

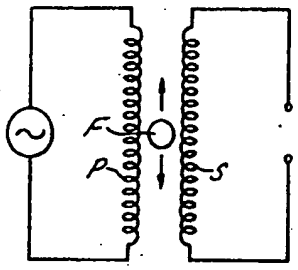

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Fig.1.

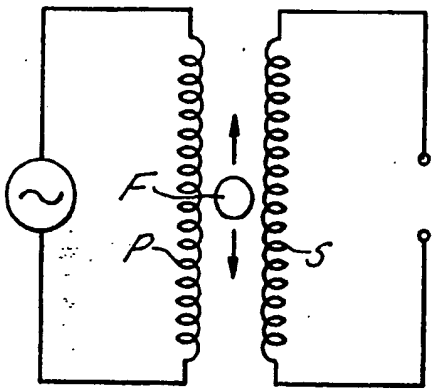


Fig.2.

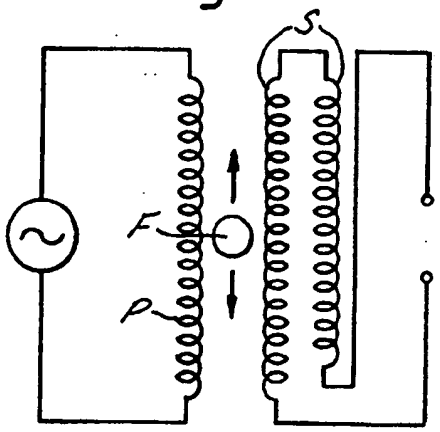


Fig.3.

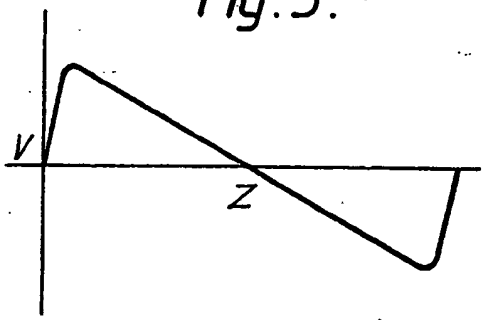
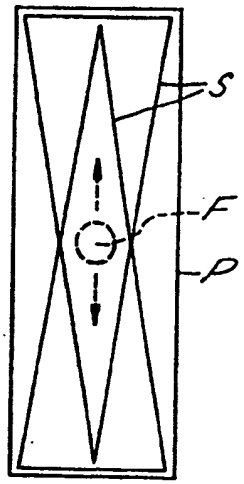


Fig.4.



SPECIFICATION

Position indicating apparatus

This invention relates to position indicating apparatus and is primarily directed to such apparatus for analogous indication of liquid level.

According to the invention position indicating apparatus comprises elongate primary and secondary mutual inductance coils arranged so that inductance in the secondary coil is linearly variable over its length and wherein there is a metallic member associated with the position to be indicated and displaceable along the secondary coil to cause a local perturbation in the magnetic field. In such an indicator the induced voltage in the secondary coils is analogous to the position of the metallic member.

The coils may be helically wound the secondary coil having a varying number of turns over its length to produce a linearly variable inductance or the coils may be of substantially planar form the secondary coil being triangular to produce a linearly variable inductance in the secondary coil.

The apparatus may include a pair of helically wound secondary coils wound in opposite sense and connected differentially so that the standing induced voltage is eliminated. Alternatively the apparatus may include a pair of opposed triangular secondary coils connected differentially so that the standing induced voltage is eliminated.

The invention finds application in analogue measurement of liquid level, the metallic member constituting a float.

Apparatus embodying the invention is described by way of example with reference to the accompanying diagrammatic drawings wherein,

Figure 1 is a circuit diagram,

Figure 2 is an alternative circuit diagram,

Figure 3 is a voltage output/displacement curve, and

Figure 4 is a circuit diagram of an alternative apparatus.

The apparatus indicated diagrammatically in Figure 1 comprises primary and secondary mutual inductance coils P and S, and F indicates a metallic member which is displaceable parallel to the coils. P is a coil of regular helical winding connected to an alternating current source whilst S is a helically wound coil having a varying number of turns/unit length so that induction is linearly variable over its length. When the metallic member F is displaced parallel to the coils it creates a local perturbation in the magnetic field the resultant change in the induced voltage being dependent on the position of the metallic member.

The change in the induced voltage is superimposed on a standing voltage which can be eliminated by utilising two secondary coils wound in opposite senses and differentially connected as shown in Figure 2. In such an apparatus the output/displacement characteristic will change in opposite sense about a central position for the metallic member as indicated in Figure 3.

In an alternative apparatus shown diagrammatically in Figure 4 the mutual inductance coils are of substantially planar form. The primary is of elongate rectangular form whilst the differentially connected secondary coils are of elongate triangular form.

It is envisaged that the apparatus can be utilised to measure rate of flow of a liquid by measuring the position of a float supported by fluid flow in a vertical duct of variable cross-section.

CLAIMS

1. Position indicating apparatus comprising elongate primary and secondary mutual inductance coils arranged so that inductance in the secondary coil is linearly variable over its length and wherein there is a metallic member associated with the position to be indicated and displaceable along the secondary coil to cause a local perturbation in the magnetic field.

2. Position indicating apparatus according to claim 1 wherein the coils are helically wound the secondary coil having a varying number of turns over its length to produce a linearly variable inductance.

3. Position indicating apparatus according to claim 1 wherein the coils are of substantially planar form the secondary coil being triangular to produce a linearly variable inductance in the secondary coil.

4. Position indicating apparatus according to claim 2 wherein there is a pair of helically wound secondary coils wound in opposite sense and connected differentially so that the standing induced voltage is eliminated.

5. Position indicating apparatus according to claim 3 wherein there is a pair of opposed triangular secondary coils connected differentially so that the standing induced voltage is eliminated.

6. Position indicating apparatus substantially as hereinbefore described with reference to any one of Figures 1, 2 and 4 of the accompanying drawings.

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